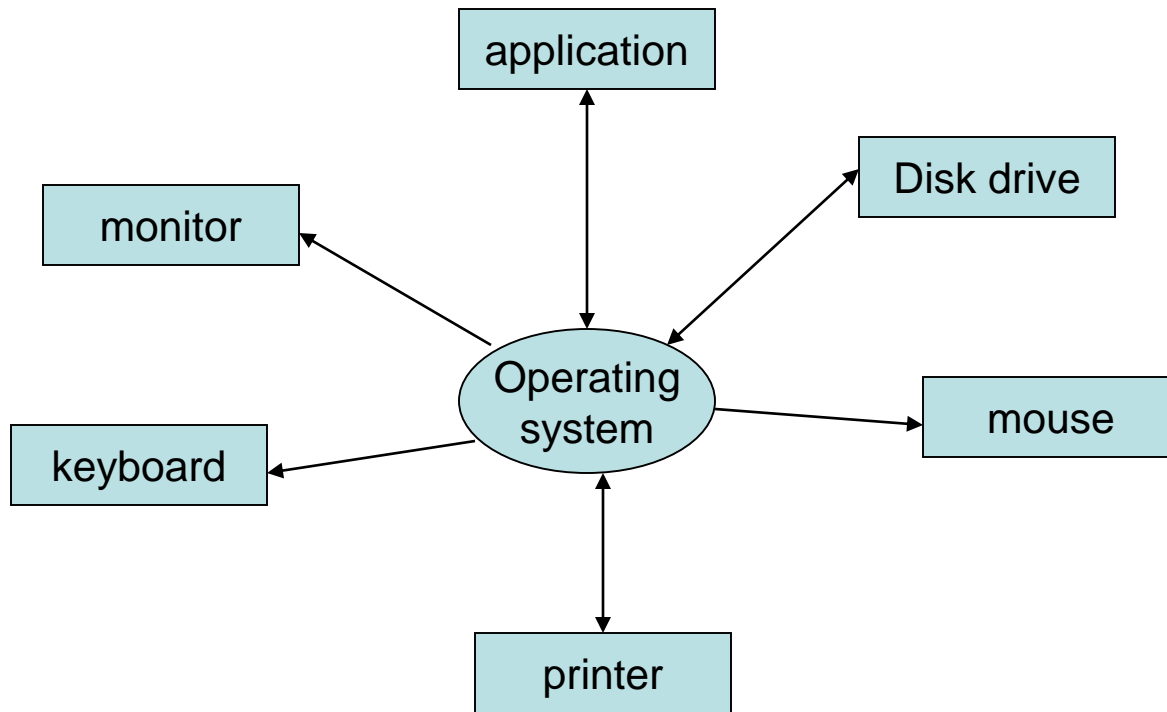


# *OPERATING SYSTEM*



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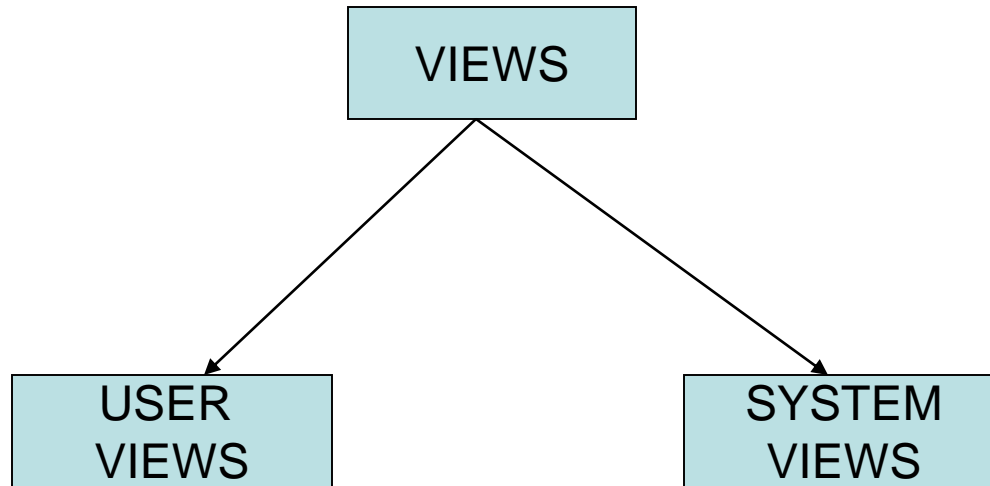
# OVERVIEW

INTRODUCTION:- Operating System is a program which manages all other programs in a computer. It is a set of programs that lies between application software and computer hardware.

The operating system software is an interface between hardware and application software. Operating system provides the environment in which user can do their jobs. It makes use of computer efficient.

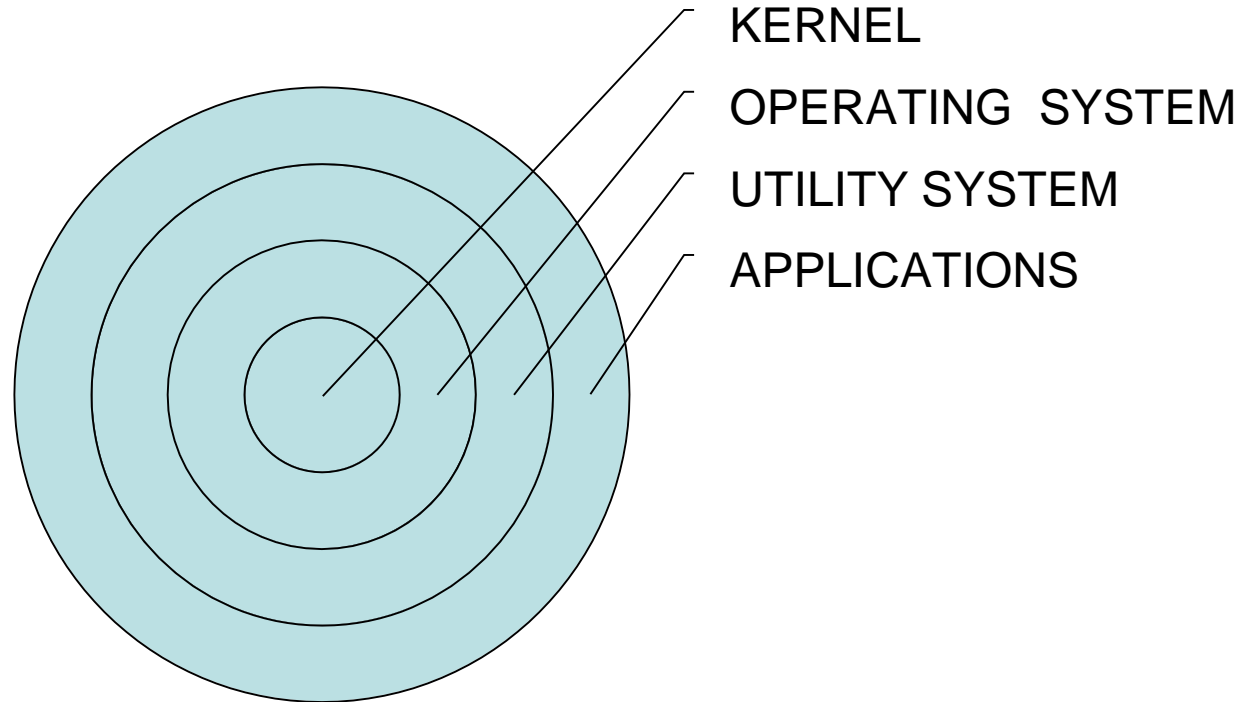
DEFINITION:- “Operating System is a control program which will help the user to control all the execution of programs and create an interaction between user and hardware, because user can perform their tasks with efficient manner.”

# *VIEWS OF OPERATING SYSTEM*



- USER VIEW:- User view of the computer varies by the interface being use. System which consist of a monitor , keyboard , mouse and system units design for one user to monopolize its resources.
- SYSTEM VIEW:- The operating system is the program that is most intimate with the hardware . We can view an operating system as a resource allocator.

# *STRUCTURE OF OPERATING SYSTEM*

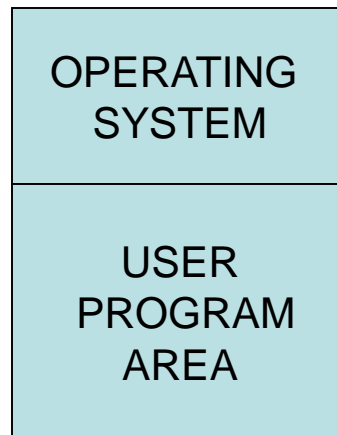


- Kernel:-The kernel which is the care of os. The kernel is also called real time executive. The kernel contains all the devices that interact with the hardware.
- OPERATING SYSTEM:-Operating system controls and coordinates the use of hardware among the various applications programs for the various users.
- Utility system:- The system utilities are programs that perform individual , specialized management tasks.
- APPLICATIONS :- Applications such as words processor , spreadsheet , compilers define the way in which these resources are used.

# *TYPES OF OPERATING SYSTEM*

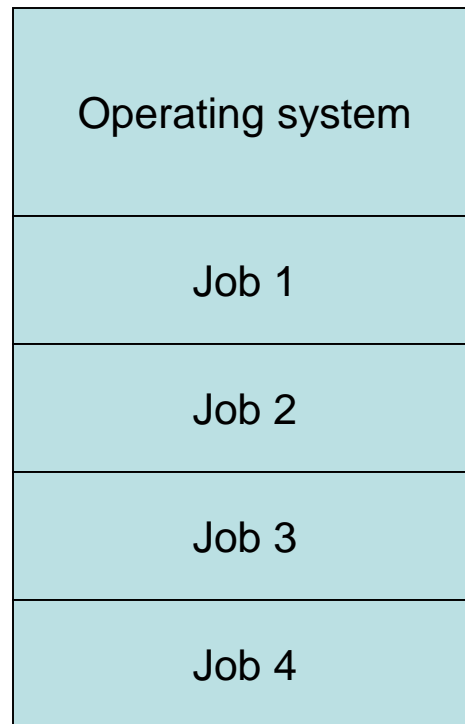
*Types of operating system is written in below:-*

- 1.) Single user:- In this only one user can operate on single operating system. For example “MS- DOS”*
- 2.) MULTI USER:- In this multiple users can operate on single operating system. A Multiuser operating system allows many different users to take advantage of the computer resources simultaneously. For example “windows”*
- 3.) BATCH SYSTEM:- In batch processing user can execute programs in batch form . each batch contains similar type of programs. batches are made by server and execute by operating system*

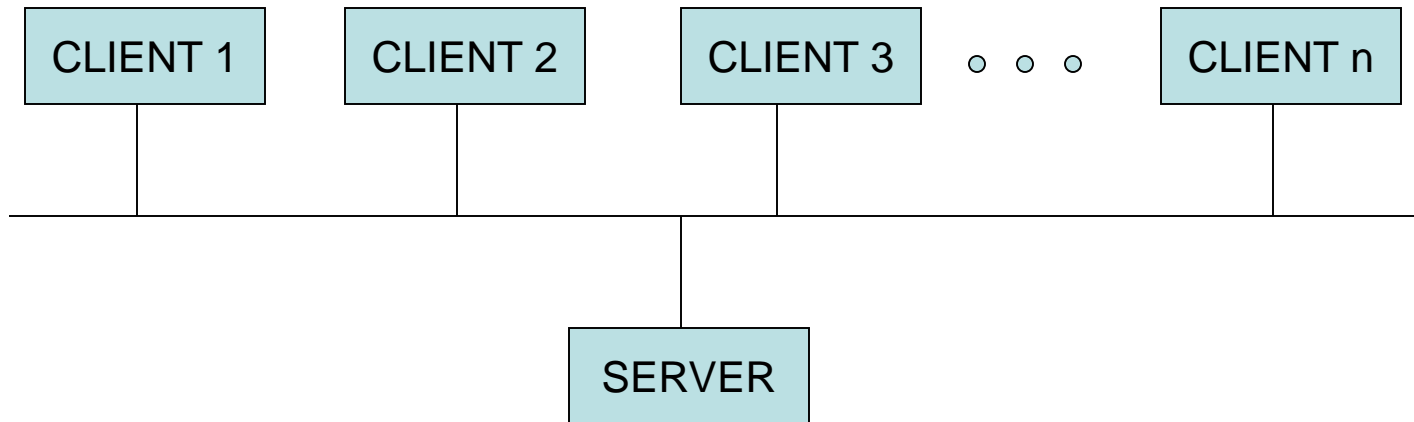




4.) MULTI PROGRAMMING SYSTEM:-the operating system keeps several programs in memory simultaneously. it increases CPU utilization by organizing job so that the CPU always has one to executed.



5.) PEER TO PEER SYSTEM: -in this different type of systems are connected with straight line and first system will be consider as a server and other systems are known as a clients.



- 6.) Distributed System :- In distributed system is similar to a client server architecture. Clients request the server for their requirements and server would provide all services that is needed to clients. It allows multiple application program to cooperate to solve participate task.
- 7.) Real time:- real time consist all that time which is required to the execution of the programs. Real time is of two types that is hard time and soft time.

## *SERVICES OF OPERATING SYSTEM*

- *PROGRAM EXECUTION*: -the system must be able to load a program into memory and to run that program .the program must be able to end its execution, either normally or abnormally.
- *I/O operations*: -a running program may be required i/o. the operating system must be provide a means to do .
- *File system manipulation*: -the file system is of need to read and write files. Program also need to create and delete file by name.

- Communications :- communications may be implemented via shared memory , or by the technique of message passing .
- Error detection:-The operating system needs to be aware of possible error. Errors may be occur in CPU and memory hardware.
- Accounting :-the record of operating system keeping may be used for accounting or simply for accumulating uses statistics.

## PROCESS

*The term process was first used by the designers of the MULTICS in 1960. the term process, used some what interchange with task or job. A process include pc, register and variables.*

*DEFINITIONS:- “when a program in execution is informally known as process.”*

# *STATES OF PROCESS*

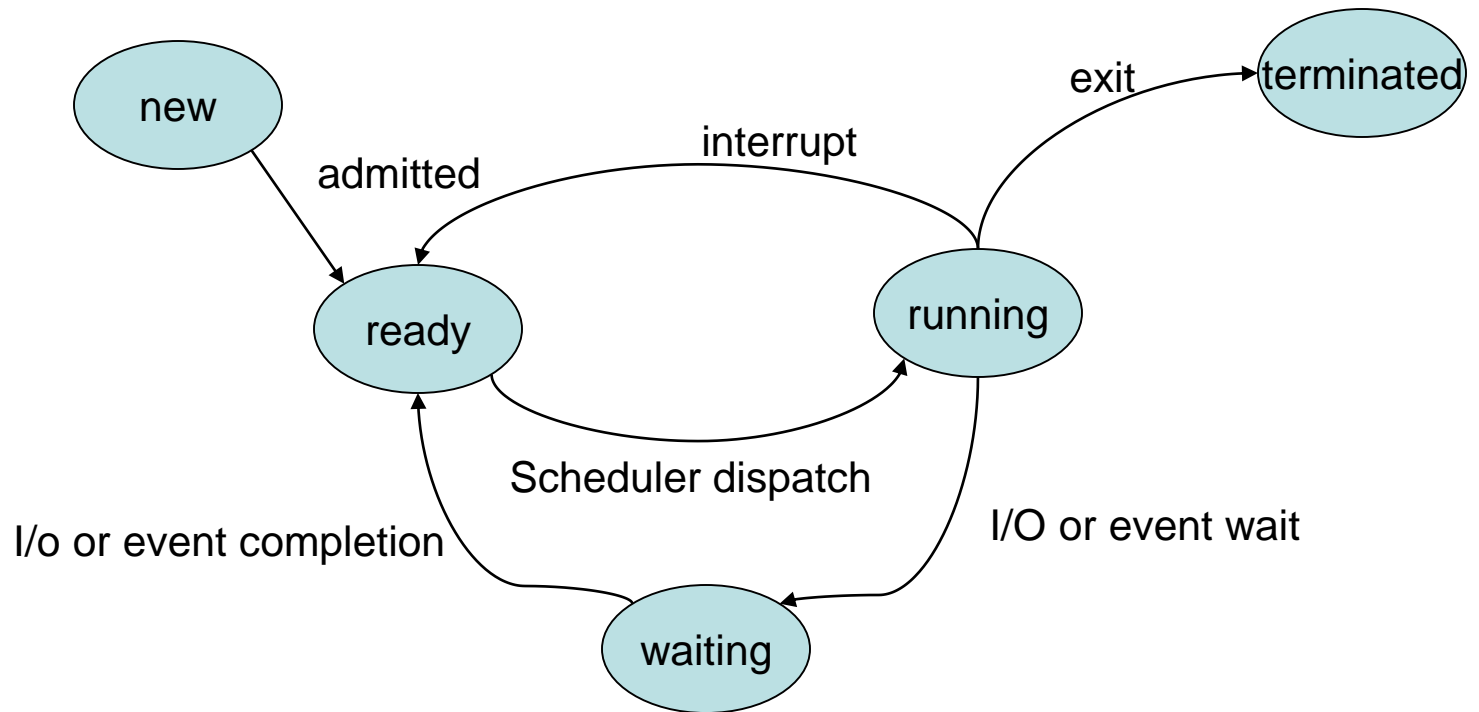


Diagram of process state

- *NEW:- The process is being created.*
- *RUNNING:- Instruction are being executed.*
- *Waiting:- The process is waiting for some event to occur.*
- *READY:-The process is waiting is to be assigned to a processor.*
- *TERMINATED:- The process has finished executions.*
- *As a process executed , it changes state. The state of a process is defined in part by the current activity of that process.*



# PROCESS CONTROL BLOCK

*Process are represented by PCB . PCB is also called a task control block. Scheduler handles the processes maintained in the form of PCB. It acts as a complete record of process and has following parts*

pointer	Process State
Process number	
Program counter	
registers	
Memory limits	
List of open files	
○	
○	

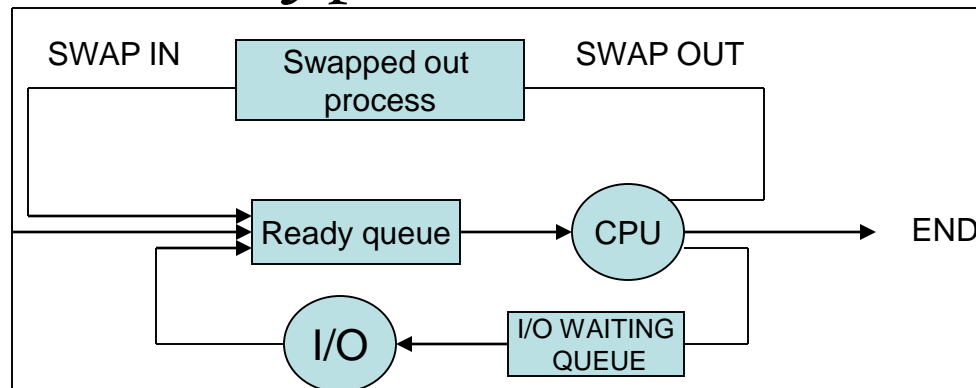
Process control block

- process state:- the state may be new , ready , running , waiting and so on.
- Program counter:-PCB contains the address of next instruction to be executed.
- CPU REGISTERS:-The registers vary in number and type , depending on the computer architecture. They include accumulators , index register and stack pointers.
- MEMORY-MANAGEMENT INFORMATION:- PCB holds value of base & limit register, page table or depending on the memory system used by the operating system.
- I/O STATUS INFORMATION:- This information includes the list of i/o devices allocated to this process a list of open files etc allocated to the process is stored in PCB.

# SCHEDULING

- Scheduling :- scheduling is a fundamental operating system function. Every computer resource is scheduled before use . CPU is one of the primary computer resource . scheduling is classified as :-

- 1.) long term :- which process to be admit.
- 2.) medium term :- which process to swap in or out .
- 3.) short- term :- which ready process to execute next.



# INTERPROCESS-COMMUNICATION

- *Inter-process communication is a "means of information sharing and synchronization" between process.*
- *In computing, **Inter-process communication (IPC)** is a set of methods for the exchange of data among multiple threads in one or more processes. Processes may be running on one or more computers connected by a network. Inter processor communication in a multiprocessor system . This allows a program to handle many user requests at the same time.*

# THREADS

*Threads are processes that share an address space. That is, there are multiple threads of control and a single address space. Each thread has a program counter, register and run time stack.*

*“A threads sometime called a lightweight process (LWP) is a basic unit of CPU utilization. A traditional or heavyweight process has a single thread of control.”*